

Notice of Allowability

Application No.

09/882,096

Examiner

Hai Vo

Applicant(s)

JOSEPH ET AL.

Art Unit

1771

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 10/05/2006.
2. ☒ The allowed claim(s) is/are 3,5,8-10,12,14 and 17-22.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>20061201</u> |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>10/05/06;02/10/06</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Philip D. Lane on 12/01/2006.

The application has been amended as follows:

The claims:

Cancel claims 2, 4, 11 and 13.

Claim 3: (Currently Amended) The structural composite sandwich of claim 2 19 wherein the metal of said micro multi-void core is ~~fabricated from~~ selected from a group consisting of aluminum, copper, and ~~or~~ alloys of aluminum and copper.

Claim 5: (Currently Amended) The structural composite sandwich of claim 2 19 wherein said micro multi-void core comprises an extrusion.

Claim 8: (Currently Amended) The composite sandwich of claim 2 19 wherein said core ~~comprises~~ is selected from a group consisting of an aluminum ~~or~~ and aluminum alloy extrusion, and said continuous fiber metal matrix composite tape comprises an aluminum metal matrix composite.

Claim 12: (Currently Amended) The composite sandwich of claim ~~44~~ 10 wherein the metal of said micro multi-void core is ~~fabricated from~~ selected from a group consisting of aluminum, copper, and ~~or~~ alloys of aluminum and copper.

Claim 14: (Currently amended) The composite sandwich of claim 44 10 wherein said multi-void core comprises an extrusion.

Claim 17: (Currently amended) The composite sandwich of claim 44 10 wherein said core ~~comprises~~ is selected from a group consisting of an aluminum or and aluminum alloy extrusion, and said continuous fiber metal matrix composite tape comprises an aluminum metal matrix composite.

Claim 19: (Currently Amended) A structural composite sandwich comprising:

A) a micro multi-void core consisting of metal, having two planar surfaces and including a plurality of continuous, parallel, longitudinal channels which extend in a direction substantially parallel to the planar surfaces; and

B) at least one layer of a composite stiffening material attached to each of said two planar surfaces, wherein said composite stiffening material comprises a continuous fiber metal matrix composite tape, comprising continuous aluminum oxide fibers.

Claim 20: (Currently Amended) The structural composite sandwich of claim 19 wherein said ~~micro multi-void is fabricated from a metal and~~ said at least one layer of composite stiffening material comprises a continuous fiber aluminum metal matrix composite tape.

Claim 21: (Currently Amended) A structural composite sandwich comprising:

A) an extruded integral multi-void core consisting of metal, having two opposing planar surfaces and between said opposing planar surfaces a plurality of longitudinal, continuous parallel channels or voids defined by ribs extending between said opposing planar surfaces; and

B) at least one layer of a composite stiffening material attached to each of said two planar surfaces, wherein said composite stiffening material comprises a continuous fiber metal matrix composite tape, comprising continuous aluminum oxide fibers.

Claim 22: (Currently Amended) The structural composite sandwich of claim 21 wherein ~~said micro multi void is fabricated from a metal and~~ said at least one layer of a composite stiffening material comprises a continuous fiber aluminum metal matrix composite tape.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: Note that Applicants' amendment and Examiner's amendment are sufficient to overcome the prior art and sufficient to place the instant claims in condition for allowance. Of the references of record, the most pertinent are Chapman, Jr. (US 6,655,633), Newell (US 5,407,727).

Chapman discloses a composite structure comprising a tubular core sandwich between two skin layers of continuous fiber metal matrix composite (figures 1, 3 and 21D; column 10, lines 55 to column 11, lines 5-45). The tubular core has two planar surfaces, including a plurality of continuous, parallel, longitudinal channels extending in a direction perpendicular to a thickness direction (figure 21D). Chapman discloses both the tubular core and skin layers made from a continuous fiber metal matrix composite material so these structural elements become bonded together and cooperate to provide an integrally formed one-piece monocoque structure (column 9, lines 33-35,

column 11, lines 35-55). Chapman also teaches the tubular core formed with multilayers of composite material having fibers aligned in controlled orientation so as to provide a structural element which is capable of reacting forces in multiple direction (column 9, lines 40-50). Those skilled in the art would not have been motivated to substitute a metal for the plies of composite material because to do so would defeat the objectives of Chapman. Additionally, the "consisting of" claim language as recited by instant claims 19 and 21 excludes the presence of the fibers which is a required component of the core taught by Chapman.

Newell discloses a structural component comprising a metallic tubular core sandwich between two skin layers of continuous fiber reinforced metal matrix composite tape (figures 4 and 8). The tubular core comprises a plurality of channels extending along a thickness direction of the structural component. In complete contrast from Newell, the present invention requires the multi-void core comprising a plurality of continuous parallel channels extending in a direction substantially perpendicular to a thickness direction.

Note that a provisional obviousness-type double patenting (ODP) rejection over copending Application No. 11/000,521 is the only rejection remaining in the present application. The copending Application '521 is a continuation-in-part of the present Application. In accordance with MPEP 804, the examiner should withdraw that rejection and permit the present application or the earlier-filed application to issue as a patent without a terminal disclaimer.

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None of the cited prior art, alone or in combination, teaches or suggests a structural composite sandwich as recited in the claims, the instant claims are thus deemed allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Vo whose telephone number is (571) 272-1485. The examiner can normally be reached on Monday through Thursday, from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HV

Hai Vo
**HAIVO
PRIMARY EXAMINER**

Listing of the claims

1-2. (Cancelled)

3. (Currently Amended) The structural composite sandwich of claim 2 ¹~~10~~ wherein the metal of said micro multi-void core is fabricated from selected from a group consisting of aluminum, copper, and ~~or~~ alloys of aluminum and copper.

4. (Canceled)

⁴ ~~5~~. (Currently Amended) The structural composite sandwich of claim 2 ¹~~10~~ wherein said micro multi-void core comprises an extrusion.

6-7. (Canceled)

⁵ ~~8~~. (Currently Amended) The composite sandwich of claim 2 ¹~~10~~ wherein said core ~~comprises~~ is selected from a group consisting of an aluminum ~~or~~ and aluminum alloy extrusion, and said continuous fiber metal matrix composite tape comprises an aluminum metal matrix composite.

⁶ ~~9~~. (Previously Presented) The composite sandwich of claim ⁵~~8~~ wherein said aluminum metal matrix composite includes continuous ceramic fibers.

⁷ ~~10~~. (Previously Presented) The composite sandwich of claim ¹~~10~~ wherein said multi-void core comprises a micro multi-void ranging in width from a few millimeters up to several inches.

11. (Canceled)

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§ ~~12~~. (Currently Amended) The composite sandwich of claim ~~44~~ ~~10~~ wherein the metal of said micro multi-void core is ~~fabricated from~~ selected from a group consisting of aluminum, copper, and ~~or~~ alloys of aluminum and copper.

13. (Canceled)

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q ~~14~~. (Currently amended) The composite sandwich of claim ~~44~~ ~~10~~ wherein said multi-void core comprises an extrusion.

15-16. (Canceled)

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10 ~~17~~. (Currently amended) The composite sandwich of claim ~~44~~ ~~10~~ wherein said core ~~comprises~~ is selected from a group consisting of an aluminum ~~or~~ and aluminum alloy extrusion, and said continuous fiber metal matrix composite tape comprises an aluminum metal matrix composite.

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11 ~~18~~. (Previously Presented) The composite sandwich of claim ~~17~~ wherein said aluminum metal matrix composite includes continuous ceramic fibers.

1 ~~19~~. (Currently Amended) A structural composite sandwich comprising:

A) a micro multi-void core consisting of metal, having two planar surfaces and including a plurality of continuous, parallel, longitudinal channels which extend in a direction substantially parallel to the planar surfaces; and

B) at least one layer of a composite stiffening material attached to each of said two planar surfaces, wherein said composite stiffening material comprises a continuous fiber metal matrix composite tape, comprising continuous aluminum oxide fibers.

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20. (Currently Amended) The structural composite sandwich of claim 10 wherein said ~~micro-multi-void is fabricated from a metal and~~ said at least one layer of composite stiffening material comprises a continuous fiber aluminum metal matrix composite tape.

12 21. (Currently Amended) A structural composite sandwich comprising:

A) an extruded integral multi-void core consisting of metal, having two opposing planar surfaces and between said opposing planar surfaces a plurality of longitudinal, continuous parallel channels or voids defined by ribs extending between said opposing planar surfaces; and

B) at least one layer of a composite stiffening material attached to each of said two planar surfaces, wherein said composite stiffening material comprises a continuous fiber metal matrix composite tape, comprising continuous aluminum oxide fibers.

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13 22. (Currently Amended) The structural composite sandwich of claim 21 wherein said ~~micro-multi-void is fabricated from a metal and~~ said at least one layer of a composite stiffening material comprises a continuous fiber aluminum metal matrix composite tape.